

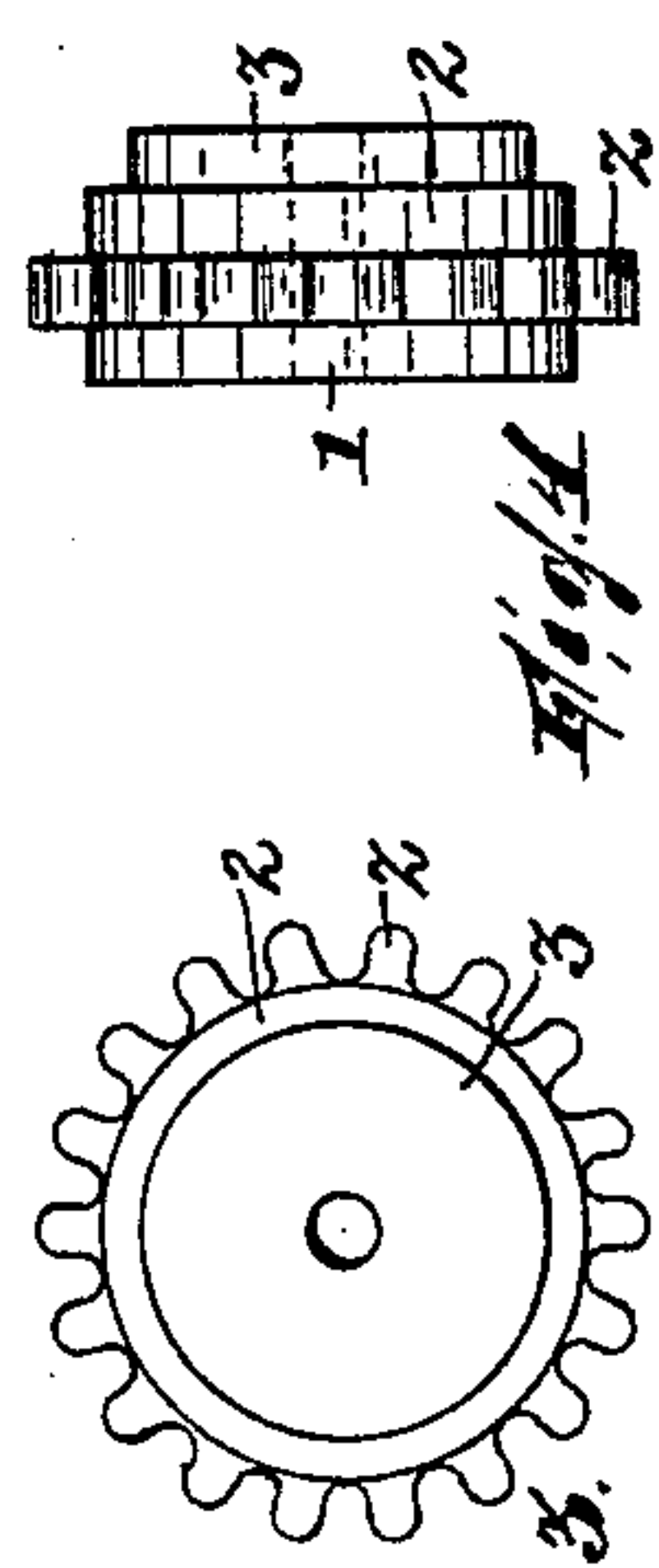
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PATENTED JUNE 21, 1904.

F. BENZ, JR.
NARROW WARE LOOM.

APPLICATION FILED APR. 11, 1904.

NO MODEL.



UNITED STATES PATENT OFFICE.

FREDERICK BENZ, JR., OF HALEDON, NEW JERSEY.

NARROW-WARE LOOM.

SPECIFICATION forming part of Letters Patent No. 763,247, dated June 21, 1904.

Application filed April 11, 1904. Serial No. 202,487. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK BENZ, Jr., a citizen of the United States, residing in Haledon, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Narrow-Ware Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

My invention relates to narrow-ware looms of the type wherein shuttles are reciprocated back and forth through the sheds from reciprocating racks operating on the shuttles through pinions. The shuttles are ordinarily arranged to travel in shuttle-blocks having guiding-grooves or raceways in which the shuttles work, and there are usually two pinions to each shuttle, one in or adjacent each block. Each shuttle works back and forth across the space between two adjoining blocks and is so constructed with reference to the driving-pinions that it is always engaged with one of them. The shuttles have usually a forwardly-projecting portion (ordinarily a "bow") which serves to lay the filler up close to the fell of the cloth. On account of this forwardly-projecting portion the center of gravity in the shuttles finds itself considerably forward of the vertical plane in which the pinions engage the shuttles. The shuttles thus tend to "dip." While the shuttle stands in the mid-position with relation to two adjoining shuttle-blocks this tendency on the part of the shuttle to dip is counteracted by the threads forming the under portion of the shed; but the more the shuttle is moved from this position to one side or the other so the effect of counteracting the dip is more or less transferred to the shuttle-blocks, with the consequence that in time a considerable wearing away of the contacting surfaces of the shuttle and blocks results. This wearing away is of course objectionable for requiring

frequent repairs on account of the undue lost motion produced; but aside from that in a certain kind of narrow-ware loom of the general class now being referred to it furnishes the real cause for its not being possible to increase the output of the loom beyond a certain limit, both as respects the speed of the loom and the weaving-space thereof. In looms of this class where in order principally to save space the shuttles travel in arcs of circles the wear on the shuttle-blocks comes mostly at the entrances to the grooves and gradually reduces as the grooves curve upwardly toward a vertical tangent, owing to the fact that the dipping action of the shuttle gradually reduces as the shuttle leaves the horizontal position. In order to counteract this wear, the blocks must, of course, be made wider than would be otherwise necessary, with a view to increasing the bearing-surfaces at the entrances to the grooves. This widening of the blocks means a loss of weaving-space which would be otherwise available. Besides that it increases the distance which each shuttle has to travel, and since the length of throw of the shuttles is an essential factor to be considered in the attainment of high speed in reciprocating the shuttles the speed of the whole loom is really dependent on the length of throw of the shuttles.

In view of the foregoing this invention has for its principal object to provide a simple, inexpensive, and generally practical means for avoiding the wearing away referred to, and so making possible both an increase of weaving-space in the loom and an augmentation of speed.

My invention will be found fully illustrated in the accompanying drawings, wherein—

Figure 1 is a front view of a section of the batten structure of a narrow-ware loom constructed after the principles of my invention. Fig. 2 is a sectional view taken on the line *xx* in Fig. 1, and Figs. 3 and 4 are a face view and side view of a detail of the invention.

In said drawings, *a* is the batten proper, *b* one of two or more uprights bolted to the batten, and *c* a horizontal brace-rod arranged

above and parallel to the batten and in part supported by said uprights.

The shuttle-blocks may, it will be understood, be of any suitable form. In the construction shown they comprise a body-piece *d*, in which the grooves or raceways *e* are formed and a recess *f* provided, the latter being cut into the same from the front face thereof and adapted to receive the rotary member, hereinafter described, whereby the shuttles are driven and the wearing away of the shuttle-blocks and shuttles prevented. Said blocks also comprise a plate *g*, which coöperates with the body-piece *d* to support the axis of the member above referred to. The parts *d* and *g* are secured together by screws *h*, and partly by means of a screw *i*, which secures the block to the brace-rod, each block is fixed in position as a part of the batten structure.

j is the usual groove formed in the top of the batten under the shuttle-blocks and forming the raceway for a reciprocating rack *k*.

l designates the shuttles. As usual, each shuttle comprises a body portion *m* and an outwardly-projecting bow portion *n*. In the top of the body portion *m* is formed the usual longitudinal groove *o*, which receives the rib *p* at the top of each raceway *e* in the shuttle-block. The under surface *q* of the body portion *m* of the shuttle bears on the lower surface *r* of each groove of the shuttle-blocks, and at the junction between the body portion and bow portion of the shuttle there is formed on the under side of the latter a longitudinal projection or rib *s*, whose under bearing-surface *t* and back bearing-surface *u* respectively engage the surfaces *v* and *w* going to make up the sectional contours of the lower portions of the grooves *e* of the shuttle-blocks.

The under surface *q* of each shuttle is divided longitudinally by the shuttle-rack teeth *x*, which are so arranged that when the shuttle is in position they stand directly over the teeth *y* of the rack *k*.

The member hereinbefore referred to comprises a pinion *z* and rollers 1 2 3, fixed together in such relation that the pinion stands between the rollers 1 and 2 and the roller 2 stands between the pinion and roller 3. These several parts are concentric and are journaled on an arbor 4 in between the plate *g* and the opposed portion of the body-piece *d* of the shuttle-block, the pinion of course engaging the rack *k* and also (when the shuttle is in the corresponding block) the rack of the shuttle and the rollers 1 and 2 being engageable with the surface *q* of the shuttle, while the roller 3 is engageable with the surface *t* of the shuttle.

The arrangement is such that so long as the shuttle is but slightly on one side or the other of the mid-position between any two shuttle-blocks it will take support on the rollers 1, 2, and 3, and particularly rollers 2 and 3. At

the same time its rack will be engaged by the teeth of the pinion, which will advance it, causing it to operate on the peripheries of the rollers without friction. In this manner any tendency on the part of the shuttle to dip is counteracted by the smooth portion of the periphery of a rotating member moving with the same velocity as itself, thus avoiding all wear on the shuttle-blocks, and practically all wear on the shuttle also, and in consequence of thus taking off of the shuttle-blocks the function of counteracting the dip of the shuttle the width of the shuttle-blocks may be reduced, so as to increase the weaving-space in the loom and the throw of the shuttle diminished, so as to make possible an increase of speed.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a narrow-ware loom, the combination of the batten structure comprising shuttle-blocks having shuttle-raceways, the reciprocating rack, the shuttles arranged to move in said raceways, and rotary combined shuttle-driving and shuttle-supporting members journaled in said batten structure each side of a weaving-space and each comprising a pinion engaged with the rack and engageable with shuttles and a roller fixed concentrically to said pinion to rotate therewith, said roller being disposed on the side of said pinion adjacent the cloth and adapted to be peripherally engaged by the under surfaces of said shuttles, substantially as described.

2. In a narrow-ware loom, the combination of the batten structure comprising shuttle-blocks having shuttle-raceways, the reciprocating rack, the shuttles arranged to move in said raceways, and rotary combined shuttle-driving and shuttle-supporting members journaled in said batten structure each side of a weaving-space and each comprising a pinion engaged with the rack and engageable with shuttles and rollers fixed concentrically to said pinion to rotate therewith, said rollers being disposed the one on one side and the other on the other side of said pinion and adapted to be peripherally engaged by the under surfaces of said shuttles, substantially as described.

3. In a narrow-ware loom, the combination of the batten structure comprising shuttle-blocks having shuttle-raceways, the reciprocating rack, the shuttles arranged to move in said raceways and each having a longitudinal rib on its under side, and rotary combined shuttle-driving and shuttle-supporting members journaled in said batten structure each side of a weaving-space and each comprising a pinion engaged with the rack and engageable with shuttles and several rollers fixed concentrically to said pinion to rotate therewith,

said rollers being disposed two on the side of
said pinion adjacent the cloth and the other
on the other side of said pinion and adapted
to be peripherally engaged by the under sur-
5 face of said shuttles, the roller nearest the
cloth by the under surfaces of the ribs of said
shuttles, substantially as described.

In testimony that I claim the foregoing I
have hereunto set my hand this 9th day of
April, 1904.

FREDERICK BENZ, JR.

Witnesses:

JOHN W. STEWARD,
ROBERT J. POLLITT.